

DOSIMETRY

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STOKELY-OAK RIDGE

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OAK RIDGE NATIONAL LABORATORY

OPERATED BY
UNION CARBIDE CORPORATION
NUCLEAR DIVISION



POST OFFICE BOX X
OAK RIDGE, TENNESSEE 37830

September 16, 1974

To: Dr. John Kreisher, Council for Tobacco Research-USA

Re: Request for Supplemental Support

From: M. R. Guerin

As we have discussed, requests for special studies and special services to expedite your inhalation bioassay studies have been more numerous and have come sooner than was anticipated when our contract to evaluate exposure systems was negotiated. Examples of such "special studies/services", i.e., those not included in the negotiated contract, include:

- (a) An immediate evaluation of the Process and Instruments (P & I) smoke exposure system.
- (b) A pilot lung dosimetry experiment using mice exposed on the Walton-Horizontal exposure system.
- (c) An evaluation of a novel animal containment system.
- (d) A study of smoke uptake by tubings of varied construction.
- (e) An in-depth operational evaluation of the LACS II and P & I systems to identify malfunctions. Neither system was operational on receipt.


We are presently discussing plans for a study of dosimetry attending the inhalation exposure of mice to smoke under various conditions. This study, to be carried out in collaboration with Microbiological Associates, is critical to identify conditions providing maximum exposure and to quantitate the exposure methodology.

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Direct Support of other CTR-USA contractors is an important part of the CTR-USA/ORNL contract and should be continued. It is apparent, however, that these added responsibilities make it impossible to meet the commitments of the original contract unless supplemental funds are provided.

We request that supplementary funds of \$94,000 be allocated to this Laboratory for its role in the collaborative studies with Microbiological Associates. A summary of responsibilities and costs and an initial protocol for the dosimetry experiment are appended.



M. R. Guerin
Director, Tobacco Smoke Research Program
Analytical Chemistry Division



J. R. Stokely
CTR-USA/ORNL Contract
Principal Investigator

MRG:JRS:scr

Attachment

cc: J. C. White
W. D. Shults
J. E. Carr
J. E. Caton
H. R. Beatty

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Responsibilities and Cost

An outline of variables to be tested and of the experimental protocol developed by Dr.'s Stokely (ORNL) and Whitmire (Microbiological Assoc.) is appended. For each set of variables tested, conditioned animals are exposed to smoke from a tracer-containing cigarette, the animals are immediately sacrificed and the target organs/tissues are analyzed for tracer content. The quantity of tracer found is converted to quantity of smoke particulates using the pre-determined specific activity of the particulates.

The responsibilities of this Laboratory are:

- (1) Preparation of Radiolabelled Cigarettes
 - (a) Weight and Pressure Drop Selection
 - (b) Spiking with Tracer
 - (c) Quality Control - specific activity of TPM, determination of TPM, water, nicotine, tar
- (2) Analysis of Resulting Samples
 - (a) Tissues, Organs, etc. from Exposed Animals - Carbon 14
 - (b) Input filters taken prior to exposure--carbon 14, nicotine, water, tar
 - (c) Chamber sample taken during exposure--nicotine, carbon 14
 - (d) Input and/or Chamber Samples taken to monitor machine--nicotine, water, tar
- (3) Information, Hardware, and Technology Transfer
 - (a) Construction and installation of synchronized chamber sampler
 - (b) Computerized handling of dosimetry data--processing, statistical analysis, study, reporting
 - (c) Transfer of radiolabelled cigarettes, radioactive samples
 - (d) On-site instruction and set up--input and chamber sampling, TPM determination, sample preparation, etc.

Using the projected (see appended protocol) numbers of samples as a guide, allowing for an additional 15% in the number of samples for experiments which must be repeated and an additional 15% for experiments using a continuous smoke generator, personnel/budget requirements are as follows.

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1. Personnel (85,000)
 - (a) Technician (1.5 manyears). Analysis of tissues and filters for carbon-14, tracer, cigarette selection
 - (b) Chemist, B.S. level (0.75 manyear). Analysis of filter samples for nicotine and water, quality control analyses, radiolabelled cigarette preparation, coordinate technicians, data handling.
 - (c) Chemist, Ph.D. level (0.25 manyear). Initial set-up, liaison with collaborators, data study, person-in-charge.

2. Special Supplies (3,900)
 - (a) Carbon-14 dotriacontane tracer (for 600 cigarettes) 900
 - (b) Analytical supplies (liquid scintillation supplies, solvents, standards, chromatographic supplies) 3,000

3. Miscellaneous (5,100)
 - (a) Travel (4 visits to Microbiological Associates by 2 scientists; 8 man-trips) 2,000
 - (b) Synchronized Chamber Sampler 1,100
 - (c) Shipping Radioactive Samples 2,000

TOTAL (94,000)

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